

Foreword

"The State of Recycling in South Carolina" is a report designed to offer readers another perspective as well as more insight into the recycling figures recently published in the S.C. Solid Waste Management Annual Report, compiled by the S.C. Department of Health and Environmental Control's (DHEC) Solid Waste Planning and Compliance Section. This supplement covers Fiscal Year 2001 (FY01), July 1, 2000 through June 30, 2001. The information compiled for both reports comes from all 46 counties as well as transfer stations and other disposal facilities.

In this report, the following is provided:

- A summary of recycling efforts in South Carolina;
- An easy comparison of collection figures for the materials recycled;
- A pricing history for recycled commodities; and
- A view of market trends.

"The State of Recycling in South Carolina" was written, edited and designed by DHEC's Office of Solid Waste Reduction and Recycling (Office), a non-regulatory section of the agency and the S.C. Department of Commerce's Recycling Market Development Advisory Council.

If you are seeking more detailed information discussed in this report, please refer to the 2001 S.C. Solid Waste Management Annual Report. For the most current information, contact Celeste Duckett at (803) 896-4226 or ducketcw@dhec.state.sc.us to receive a copy.

This is the first time this report has been published. We hope it provides South Carolinians and others with a better understanding of recycling efforts in our state.

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About This Report...

"The State of Recycling in South Carolina," 2001 Edition, is published by the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling and the S.C. Recycling Market Development Advisory Council (RMDAC).

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South Carolina Recycling Statistics

JULY 1, 2000 – JUNE 30, 2001

S.C. Population 4,012,012

MUNICIPAL SOLID WASTE (MSW) MANAGEMENT

Recycled 1,262,164 tons

Landfilled 2,893,529 tons

Incinerated 202,040 tons

Total 4,357,733 tons

MSW COLLECTED / RECYCLED

COMMODITY	AMOUNT COLLECTED
Glass	12,825 tons
Metal	396,566 tons
Paper	452,991 tons
Plastic	14,680 tons
Banned Items ¹	270,495 tons
Miscellaneous Items ²	114,607 tons
Total	1,262,164 tons

1. Banned items include the following: lead-acid batteries, waste tires, white goods, yard waste and land clearing debris.

2. Miscellaneous items include: antifreeze, consumer electronics, fluorescent bulbs, food waste (post-consumer only), household batteries, household hazardous materials, latex paint, mattresses, used oil filters and bottles, wood packaging, other wood such as furniture, cabinets and other non-packaging products and textiles.

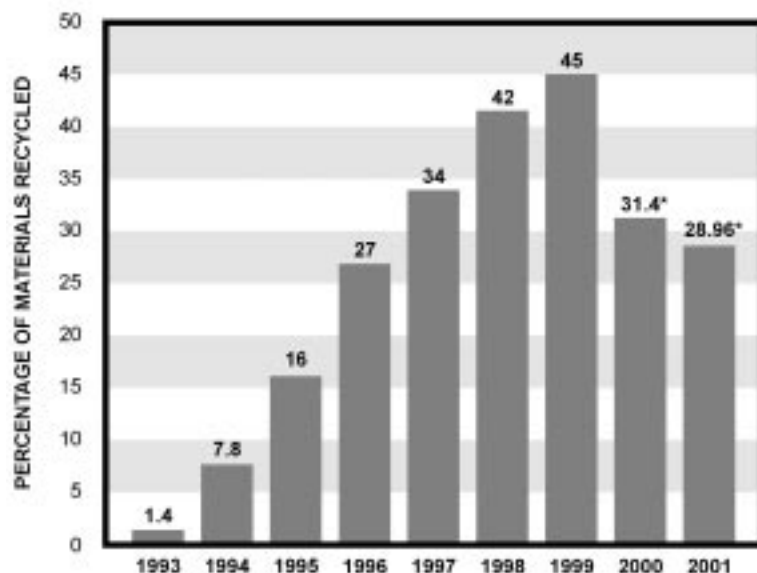
South Carolina's Recycling and Waste Reduction Rates

Recycling Rate **28.96 percent**

Waste Reduction Rate **4.2 pounds per person per day**



CHART 1: South Carolina's Recycling Rate
FISCAL YEARS 1993 - 2001



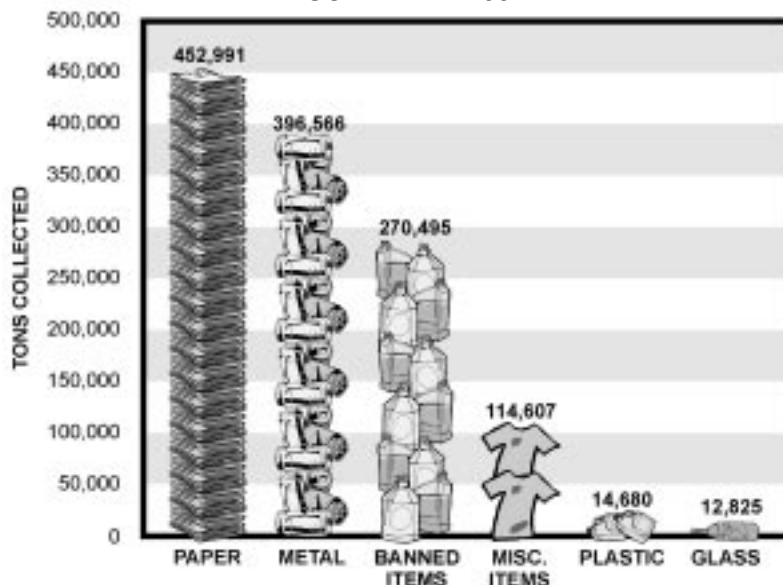
* **NOTE:** Beginning with FY00, the S.C. Department of Health and Environmental Control adopted the U.S. Environmental Protection Agency's formula for measuring its recycling rate. This new formula measures only municipal solid waste (MSW) and not the total waste stream which had been included in previous years.

Did You Know?

DHEC's Office of Solid Waste Reduction and Recycling (Office) staffs a toll-free recycling hot line for South Carolina residents and businesses. For information about educational resources, recycling center locations, used oil collection sites or starting a recycling program, call 1-800-768-7348.

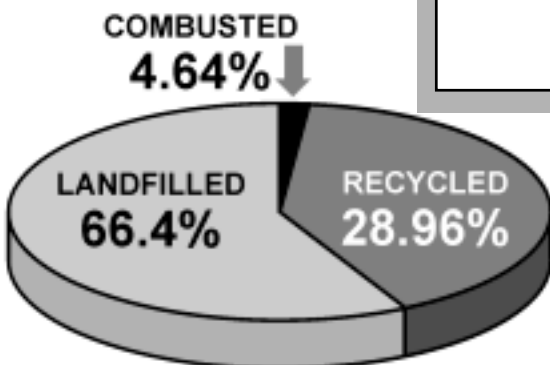
The Office also has a Web site that features the most up-to-date recycling facts and figures in addition to other on-line resources. Visit www.scdhec.net/recycle to find out more.

CHART 2: Recyclables Collected in S.C.
FISCAL YEAR 2001



SOURCE: The 2001 S.C. Solid Waste Management Annual Report

CHART 3:
Where does solid waste go in South Carolina?
FISCAL YEAR 2001



SOURCE: The 2001 S.C. Solid Waste Management Annual Report

Executive Summary

Since the S.C. Solid Waste Policy and Management Act (Act) was enacted in 1991, many communities in South Carolina have implemented recycling programs. Eleven years later, many wonder how effective waste reduction and recycling initiatives have been. This report provides an overview of the growth of recycling in South Carolina as well as addressing other issues such as how much is being collected and where we as a state can go from here.

What is Municipal Solid Waste?

Municipal solid waste (MSW) is the combined residential, commercial, institutional/non-profit and industrial packaging/administrative waste generated on a daily basis. This includes paper, cans, bottles, food scraps, yard waste, packaging and other items. What it does NOT include is industrial pre-consumer process waste like scraps and by-products resulting from the manufacturing process, agricultural waste, mining waste and sewage sludge as well as hazardous, infectious or radioactive waste.

The S.C. Solid Waste Management Annual Report addresses both total solid waste, including industrial pre-consumer figures and municipal solid waste. In contrast, this report will focus mostly on MSW because residents and commercial entities make the greatest impact on waste reduction and recycling rates. Please refer to page 24 for a brief summary of industry related recycling figures, compiled by the Recycling Market Development Advisory Council (RMDAC).

History of Waste Reduction and Recycling Goals

Before 1991, the majority of landfills did not have scales to weigh incoming solid waste so no one had a good idea of how much was being thrown away. Figures were estimated using national data. However, all of that changed with the passage of the Act.

The Act required each county or region to submit an annual progress report detailing its solid waste and recycling activities. The purpose of the progress report is to standardize reporting and to provide solid waste officials with the most up-to-date information regarding solid waste in South Carolina. In addition, categorizing the waste by MSW allows for comparisons between South Carolina's disposal data and disposal data from other states.

South Carolina's waste reduction and recycling goals were also set forth in the Act. Those goals have since been amended. Originally, the waste reduction goal was based upon the amount of solid waste being disposed of in MSW landfills, and the recycling goal was based upon total recycling efforts, which included industry figures.

Changes to the Act became effective October 3, 2000. The current waste reduction and recycling goals are based upon the U.S. Environmental Protection Agency's (U.S. EPA) definition of MSW from its report, "Municipal Solid Waste in the United States." The new recycling goal of



You Should Know...

While U.S. Environmental Protection Agency (U.S. EPA) identifies automobile tires as MSW, it does not consider the combustion of tires for fuel as a form of recycling. The U.S. EPA considers combustion a form of disposal. In contrast, South Carolina considers the combustion of waste tires a form of recycling.

Did You Know?

The S.C. Solid Waste Policy and Management Act of 1991, amended in October 2000, now states, "It is the goal of this State to reduce, on a statewide per capita basis, the amount of municipal solid waste being generated to 3.5 pounds per day no later than June 30, 2005...It is the goal of this State to recycle, on a statewide basis, at least 35 percent calculated by weight, of the municipal solid waste stream generated in this State no later than June 30, 2005."

35 percent is based upon MSW recycling efforts and the reduction goal of 3.5 pounds per person per day is based upon the amount of MSW generated per person per day.

The Bottom Line

How much solid waste was generated and where did it go? In South Carolina, 4.3 million tons of MSW was generated. There were 19 MSW landfills operating in FY01. About 2.8 million tons of MSW was sent to those landfills.

Another disposal method is incineration. While South Carolina has four permitted incinerators, only one incinerates MSW. It is the Foster Wheeler Resource Recovery Facility in Charleston County. It incinerated 202,040 tons of MSW in FY01.

That means about 1.2 million tons of MSW was recycled. But what do South Carolinians recycle? The Commodities Section, beginning on page 7 of this report, provides a comprehensive look at most materials, including what defines a particular material, how much was recycled, what is the pricing history and what are the current and future trends for the commodity.

This leads to another question. What types of recycling programs are available to residents in South Carolina? According to the 2001 S.C. Solid Waste Management Annual Report, almost 600,000 households receive curbside collection of both recyclables and solid waste through various curbside programs throughout the state. And the number of staffed drop off sites, also known as recycling centers, has increased to 409 which serves about 1.3 million households. Every county has at least one drop-off site. In fact, some counties have as many as 20, strategically located around the county for easy access by residents.

How is South Carolina doing when it comes to recycling? In FY01, 28.96 percent of MSW generated was recycled, six points short of the 35 percent goal. And the state is almost a pound over the waste reduction goal of 3.5 pounds, with South Carolinians disposing 4.2 pounds of MSW per person per day.

What is the reason for the decrease in the state's recycling rate? More than likely economic conditions, including depressed markets, impacted both the waste reduction and recycling rates.

Many local governments and businesses base their recycling programs on economic feasibility, and when this is affected, collection programs suffer. While the accuracy of the numbers reported continues to improve, the main factor for lower rates is economics.

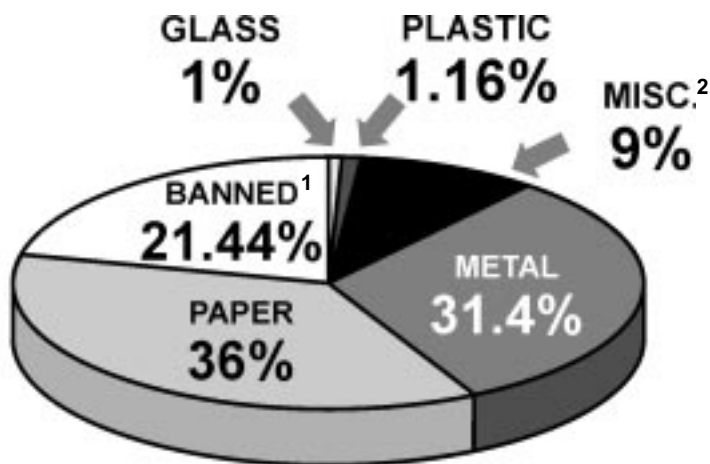
Commodities

This chapter highlights the traditional commodities that form the foundation for most recycling programs. Each section will define and/or describe the commodity, show the recycling rate (in tons) for the past nine years and the pricing history for the particular commodity or subgroups over the past five years.

Historical pricing information was provided by www.wastenews.com. These prices reflect the Southeastern market, based in Atlanta. Unless otherwise noted, they are in dollars per ton and include delivery to the door.

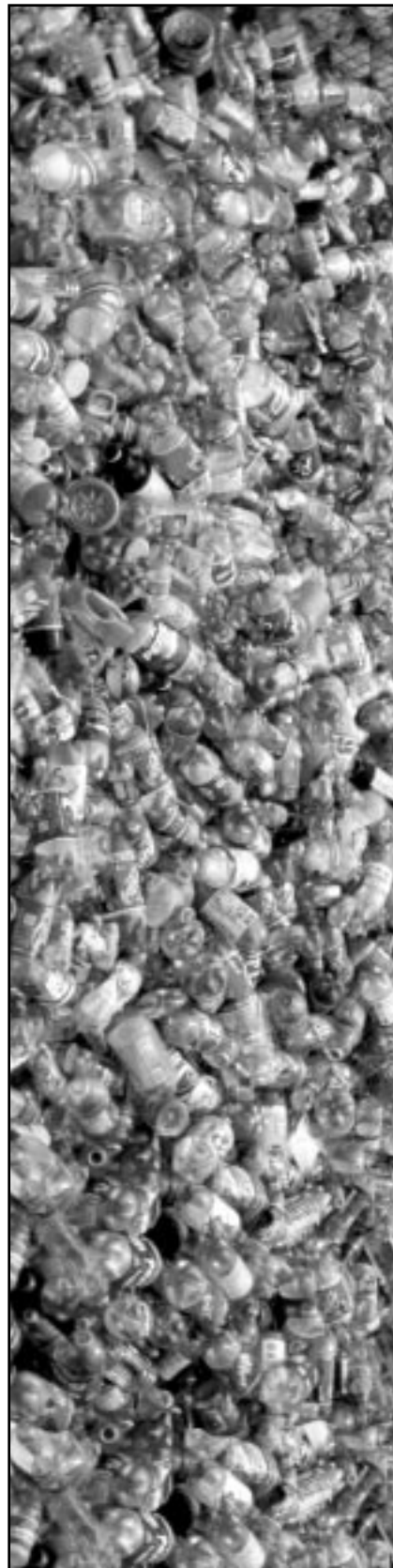
The Recycling Market Development Advisory Council (RMDAC) has provided a forecast of current and future trends for the various commodities. The aluminum representative for RMDAC, Scott Courtney with Alcoa - Mt. Holly, noted in his report, "As with any commodity, trading is now a global business. Any unexpected changes in (domestic) production requirements, the world-wide value of the dollar or significant shifts in export markets, will affect pricing." In other words, there are many outside forces that can affect a recycling program's success and profit margin.

CHART 4: Recyclables Collected in South Carolina by Percentage
FISCAL YEAR 2001



1. Banned items include the following: lead-acid batteries, waste tires, white goods, yard waste and land clearing debris.
2. Miscellaneous items include: antifreeze, consumer electronics, fluorescent bulbs, food waste (post-consumer only), household batteries, household hazardous materials, latex paint, mattresses, used oil filters and bottles, wood packaging, other wood such as furniture, cabinets and other non-packaging products and textiles.

SOURCE: The 2001 S.C. Solid Waste Management Annual Report



Glass

As defined by the U.S. EPA, this commodity includes containers and packaging such as beer and soft drink bottles, wine and liquor bottles and bottles for food, cosmetics and other products. Thirty-five of 46 counties include glass as part of their collected materials. In addition, glass is collected mostly from drop-off sites rather than through curbside programs. Five counties continue to serve as hosts to other counties and regions that bring in glass to consolidate transportation to the vendor. Transportation costs associated with glass have made it more difficult to recycle this past year.

In FY01, 3,476 tons of clear, 2,161 tons of green and 2,059 tons of brown glass were collected. Another 5,129 tons were mixed glass. See Figure 1 for the total amount of glass collected over the last nine years. The increase in glass collection compared to last year can be found specifically in the residential category, leading to the assumption that counties have continued to educate and make glass collection an integral part of their recycling programs and also that regionalization of this commodity is effective in capturing more material.

Pricing History

The pricing history (dollars per ton) can be seen in Figures 2 - 4. Typically, clear glass gets the most dollars per ton, followed by brown and green.

Trends

Two regional processors, located in Atlanta, GA and Raleigh, NC, accept glass collected in South Carolina. Recovery rates seem to be stable, if not improving, due primarily to color sorting equipment processors now used to handle mixed color cullet. Glass processors charge around \$10 per ton for this "three-mix" material but, in many cases, this is cheaper than landfilling or separating at the collection end.

The recent price adjustment should help secure the market for recycled glass cullet. There will continue to be good demand for a clean, consistent color-separated cullet, with the exception of green glass which has limited demand because there is no green bottle manufacturer in the area.

GLASS FACT: Nearly 25 percent of the glass used to make bottles and jars has been used before, either recycled or remanufactured. Every ton of recycled glass used to make new jars saves the equivalent of 10 gallons of fuel oil. (SOURCE: Glass Packaging Institute, 2000)

FIGURE 1: GLASS COLLECTION FIGURES

All three colors are combined for total amount in tons.

FY 1993	3,881 tons
FY 1994	8,789 tons
FY 1995	50,117 tons
FY 1996	30,261 tons
FY 1997	37,837 tons
FY 1998	15,454 tons
FY 1999	14,938 tons
FY 2000	9,629 tons
FY 2001	12,825 tons

FIGURE 2: CLEAR GLASS PRICES

FY 1997	\$35.70 per ton
FY 1998	\$34.80 per ton
FY 1999	\$33.60 per ton
FY 2000	\$35.00 per ton
FY 2001	\$35.00 per ton

FIGURE 3: BROWN GLASS PRICES

FY 1997	\$22.00 per ton
FY 1998	\$20.00 per ton
FY 1999	\$19.60 per ton
FY 2000	\$22.00 per ton
FY 2001	\$22.60 per ton

FIGURE 4: GREEN GLASS PRICES

FY 1997	\$14.27 per ton
FY 1998	\$13.07 per ton
FY 1999	\$12.30 per ton
FY 2000	\$13.00 per ton
FY 2001	\$12.60 per ton

Metal

Metals are divided into two categories: ferrous and non-ferrous. Within these two categories are various subgroups including aluminum beverage, tin or steel cans, and ferrous and nonferrous that are non-beverage. What is not included in these figures are major appliances, also known as white goods and auto bodies. White goods are measured separately because they are banned from disposal in the state's landfills and auto bodies are not identified as municipal solid waste.

Whether it is scrap metal, food or beverage cans, 36 counties collect metal in their recycling programs. In fact, "tin" cans have become a more integral part of metal collection programs this past year. In FY01, 396,566 tons of metals were collected for recycling. Like other commodities, metal typically is recycled back into its original state, in this case, metal products. In fact, aluminum can recycling has become so efficient, it takes only six weeks for a recycled aluminum can to get back onto a store's shelf.

FIGURE 5: METALS COLLECTION

All types of metal are combined in tons.

FY 1993	6,174 tons
FY 1994	74,118 tons
FY 1995	81,588 tons
FY 1996	652,724 tons
FY 1997	581,227 tons
FY 1998	402,607 tons
FY 1999	463,111 tons
FY 2000	434,411 tons
FY 2001	396,566 tons

FIGURE 6: ALUMINUM CANS PRICES

FY 1997	\$0.43 per pound
FY 1998	\$0.36 per pound
FY 1999	\$0.34 per pound
FY 2000	\$0.39 per pound
FY 2001	\$0.36 per pound

The slight decrease in metals collected for recycling this year is due to a large, one-time project in FY00 that resulted in a significant amount of material being generated and recycled. This project impacted the totals for metal recycled in FY01.

Pricing History

While market prices aren't available for all subgroups within the metal category, listed below are prices for aluminum beverage cans (Figure 6) and steel beverage cans (Figure 7) only.

Trends

The current trends and market forecasts are divided between ferrous and non-ferrous:

- **FERROUS:** 2001 was another difficult year for the ferrous metal industry. Steel companies continued to suffer through recession with over 25 businesses either closing their doors or filing for bankruptcy protection during the two-year period ending in December. In South Carolina, Georgetown Steel filed under Chapter 11 but continued to operate.

Scrap prices remained consistent in the first half of the year as the shrinking availability of scrap from industrial sources matched the decrease in the requirements to produce new steel. Limited demand began impacting prices by late summer as the entire domestic manufacturing sector reported a period of zero or even negative growth.

While current prices for ferrous scrap metal are low, there is little doubt that scrap will remain a commodity of value. Mini-mills (e.g., Nucor Steel) use electric arc furnace (EAF) technology and scrap metal/scrap substitutes as their only raw

FIGURE 7: STEEL CANS PRICES

FY 1997	\$41.46 per ton
FY 1998	\$44.31 per ton
FY 1999	\$25.88 per ton
FY 2000	\$20.46 per ton
FY 2001	\$24.26 per ton

You Should Know...

Ferrous metals are magnetic metals derived from iron (steel). Products made from ferrous metals include major and small appliances, furniture and containers and packaging (steel drums and barrels).

Non-ferrous metals are non-magnetic metals such as aluminum, lead and copper. Products made from non-ferrous metals include containers and packaging such as beverage cans, food and other non-food cans.

Metal Facts...

All new steel contains recycled steel. The basic oxygen furnace uses a minimum of 25 percent steel scrap to make new steel, while electric arc furnace mills use essentially 100 percent scrap. Every ton of steel recycled saves 2,500 pounds of iron ore, 1,400 pounds of coal and 120 pounds of limestone. Through this recycling effort, the steel industry saves the equivalent energy used to power about 18 million households for a year. (SOURCE: Steel Recycling Institute, 2001)

Aluminum beverage cans have an average of 55 percent recycled content. Aluminum recycling is a closed-loop process, saving 95 percent of the energy needed to produce aluminum from ore. From recycling through reclamation and production, it can take as few as six weeks for an aluminum beverage can to be back in a store for consumer purchase. (SOURCE: The Aluminum Association, Inc., 2001)

material to produce new steel. These mills continue to experience growth at the expense of older, less efficient and mostly integrated steel mills that use only a percentage of scrap for feedstock. As long as the economy produces steel there will be a demand for scrap metal, but its value as a commodity will continue to fluctuate.

- **NON-FERROUS:** Aluminum market conditions, while at their worst level in several decades, are expected to rise modestly next year. Analysts expect that aluminum prices should begin to improve as demand increases in the second quarter of 2002. Even though the transportation sector reports a decline in sales, this area continues to introduce many innovative uses for aluminum.

The long-term future for aluminum recycling is positive. Overall demand will continue to outpace supply. The energy value that can be reclaimed through recycling continues to make this one of the most attractive and profitable materials for recycling.



Paper

Of all the commodities, paper is the most diversified with several subgroups that are separated and collected for recycling. They include corrugated cardboard, magazines, newspaper and inserts, computer printout paper, mixed office paper, telephone directories and paperboard (Figure 8). By separating the paper at collection, recycling programs get higher prices for certain grades of paper. In FY01, 452,991 tons of paper were recycled in 41 counties (Figure 9).

While there was a decrease in the commercial category of paper collected, there was a slight increase in residential and institutional/non-profit category. The decrease in commercial efforts could be the result of depressed market prices for most types of paper. However, more counties than ever have included mixed paper in their recycling programs. In addition, schools and universities have initiated paper recycling programs because it represents a significant portion of their waste stream.

Pricing History by Paper Grade

Computer printout is the most clean grade of paper on the market (Figure 10). Also, it garners the best price per ton of all paper. It is all white paper with no other contaminants such as manila envelopes, plastic windows, etc.

Corrugated cardboard – also known as OCC (old corrugated cardboard) – is the brown box with the waffle layer. It should not be mistaken for cereal and cake mixes boxes - that is paperboard, a low-grade of paper that is considered a contaminant by OCC recyclers (Figure 11).

Magazines – glossy, bound paper – usually includes magazines and catalogs (Figure 12).

Sorted office papers are different colors but have no plastic envelope windows (Figure 13).

News No. 8 is the grade of paper that includes newspapers and inserts (Figure 14).

PAPER FACT: Recycling newsprint results in an almost 40 percent reduction in total energy demand compared with virgin fiber use. (SOURCE: National Resource Defense Council, 2000)

FIGURE 8: TYPES OF PAPER RECYCLED FY01

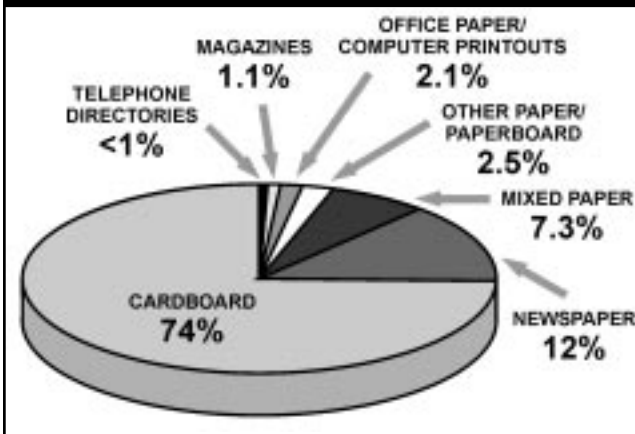


FIGURE 9: PAPER COLLECTION FIGURES

FY 1993	19,207 tons
FY 1994	60,053 tons
FY 1995	125,487 tons
FY 1996	171,709 tons
FY 1997	482,449 tons
FY 1998	1,808,644 tons
FY 1999	1,762,259 tons
FY 2000	481,998 tons
FY 2001	452,991 tons

FIGURE 10: COMPUTER PAPER PRICES

FY 1998	\$145 per ton
FY 1999	\$105 per ton
FY 2000	\$114 per ton
FY 2001	\$105 per ton

FIGURE 11: CARDBOARD (OCC) PRICES FY01

FY 1997	\$46 per ton
FY 1998	\$39 per ton
FY 1999	\$33 per ton
FY 2000	\$38 per ton
FY 2001	\$27 per ton

Trends

The paper market began the year depressed, a trend that continued throughout the year. Due to a saturated paper market, prices ended the year low. Newspaper and magazines offered the best prices this year due to the demand from Cusa Pines, a paper mill located in Alabama that began operating and is a primary user of these two types of materials. Export numbers stayed fairly strong for the year, which kept markets from worsening.

When markets are weak for long periods as they are now, the paper industry is forced to consolidate certain mills. With this backlog of supply, some packing plants may be forced to close as well. The markets for all grades will improve when the paper industry completes this process. This will help the saturated market that now exists and should improve pricing and movement in the future.

PAPER FACT: One ton of paper made with 100 percent recycled paper saves the equivalent of 4,100 kilowatt hours of energy, 7,000 gallons of water, 60 pounds of air emissions and three cubic yards of landfill space. (SOURCE: American Forest and Paper Association, 2001)

FIGURE 12: MAGAZINE PRICES

FY 1997	\$2.65 per ton
FY 1998	\$3.70 per ton
FY 1999	\$1.00 per ton
FY 2000	\$4.73 per ton
FY 2001	\$5.03 per ton

FIGURE 13: SORTED OFFICE PAPER PRICES

FY 1997	\$22 per ton
FY 1998	\$26.50 per ton
FY 1999	\$31.50 per ton
FY 2000	\$60.60 per ton
FY 2001	\$40.90 per ton

FIGURE 14: NEWS NO. 8 PRICES

FY 1998	\$25 per ton
FY 1999	\$33 per ton
FY 2000	\$69 per ton
FY 2001	\$61 per ton



Plastic

As defined by the U.S. EPA, plastic containers and packaging made from various resins, including PET, HDPE, PVC, LDPE, PP and PS, fit into this category. These resins do not include plastics in automobiles and construction products such as PVC piping.

PET and HDPE continued to lead plastic bottle recovery programs, representing 49 and 50 percent of plastic bottles recovered, respectively. Most communities accept both PET and HDPE. PET is used to make soft drink, beer, water, salad and peanut butter containers. HDPE includes milk, water and juice containers, and liquid detergent containers. Thirty-five of 46 counties collected a total of 14,680 tons of plastics in FY01.

In general, plastic bottle and jar containers (those that have a screw top neck) can be recycled while containers such as margarine tubs (those without the screw top neck) cannot be recycled. The total amount of PET and HDPE bottles available for recycling continues to be more than the number actually collected in recycling programs. Household participation is critical for collecting more bottles for recycling. Demand for post consumer flake and resins continue to be high with flake being manufactured into fiber, bottles, pipe and plastic lumber.

FIGURE 15: PLASTIC COLLECTION FIGURES

FY 1993	4,673 tons
FY 1994	2,916 tons
FY 1995	12,812 tons
FY 1996	29,187 tons
FY 1997	89,120 tons
FY 1998	38,572 tons
FY 1999	9,454 tons
FY 2000	46,859 tons
FY 2001	14,680 tons

FIGURE 16: PET PRICES

FY 1997	\$0.64 per pound
FY 1998	\$0.10 per pound
FY 1999	\$0.05 per pound
FY 2000	\$0.12 per pound
FY 2001	\$0.12 per pound

The significant decrease in plastics from FY00 to FY01 (Figure 15) can be attributed to several factors – incorrect reporting by companies the previous year (i.e. putting tonnage totals in the industrial packaging category instead of industrial pre-consumer), plant closings as well as some non-responses to a county's request for information, thereby affecting MSW totals. It is worth noting that there was an increase in residential collection due in part to increased in education efforts through print and television media.

Pricing History

Because plastics are not marketed together, the pricing history reflects how plastics are collected and subsequently separated for market.

Trends

PET Summary: Poor markets in fiber and export will continue to effect demand for 2002 until the current business climate for consumer spending strengthens. Bottle-to-bottle recycling growth will continue as well as other new applications for recycling.

HDPE Summary: HDPE recycle markets are expected to remain poor in 2002 due to overcapacity of virgin competing against recycled material. Curtailment of virgin capacity is planned to reduce the current oversupply.

FIGURE 17: PIGMENTED HDPE PRICES

FY 1997	\$0.13 per pound
FY 1998	\$0.07 per pound
FY 1999	\$0.06 per pound
FY 2000	\$0.11 per pound
FY 2001	\$0.10 per pound

FIGURE 18: NATURAL HDPE PRICES

FY 1997	\$0.21 per pound
FY 1998	\$0.11 per pound
FY 1999	\$0.10 per pound
FY 2000	\$0.19 per pound
FY 2001	\$0.17 per pound

Banned Items

Banned items are materials that can not be disposed in South Carolina's landfills. Many banned items have fees to insure a "closed loop" recycling process. These items include lead acid batteries, waste tires, white goods (appliances such as refrigerators, stoves, water heaters, washing machines, dryers and air conditioners), yard waste and land clearing debris.

While these items usually are not collected in curbside programs, most can be taken to a county's drop-off center for recycling (if not taken back by the retailer from where they were purchased). Banned items usually require a fee for recycling. Figure 19 shows a breakdown of the tonnages recycled for each commodity over the last two years.

FIGURE 19: BANNED ITEMS COLLECTED

BANNED ITEM	FY01	FY00
Lead Acid Batteries	14,904	6,940
Waste Tires	39,256	43,136
White Goods	43,366	44,291
Yard Waste and Land Clearing Debris*	172,969	239,736
TOTAL TONNAGE	270,495	334,106

* The decline in Yard Waste and Land Clearing Debris is due to the absence of tropical storms or hurricanes in 2001. Hurricane Floyd caused an increase in debris in 2000.

For Your Information: Used Oil

(Summary taken from the Used Oil Recycling in South Carolina 2000 Annual Report)

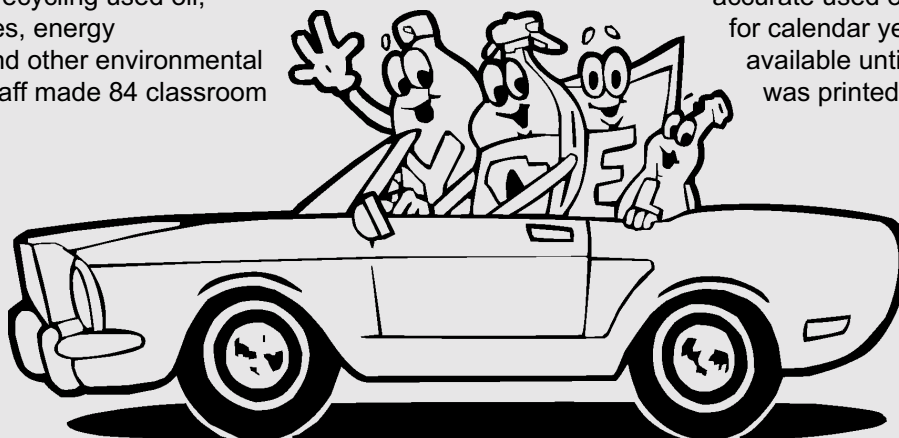
A record amount of oil, oil filters and oil bottles were recycled in calendar year 2000 by do-it-yourself oil changers (DIYers) in South Carolina, according to the most current figures compiled by DHEC's Office of Solid Waste Reduction and Recycling (Office).

DIYers recycled 1,130,857 gallons of used oil, the 10th consecutive year a record amount was collected and the second straight year that more than 1 million gallons were collected. Overall, more than 6.7 million gallons have been collected since used oil recycling efforts began in South Carolina in 1990.

Introduced in January 2000, the Office continues to offer the "Green Driver Project" which targets students in high school driver education classes with information on recycling used oil, filters and bottles, energy conservation and other environmental tips. In 2001, staff made 84 classroom

presentations to 5,833 students and others. The Office continues to work on a new educational video that will be part of the project. In addition, the Office set up a partnership with PalmettoPride: The Governor's Council on Beautification and Litter to add a litter component, including litter laws and enforcement, beginning in 2002 to the project.

NOTE: Used oil is banned from landfills but is not considered MSW. Collection figures were taken from Santee Cooper reports and DHEC's Office of Solid Waste Compliance reports instead of those reported by the counties themselves. By law, locations collecting used oil must register and report the figures to DHEC because counties aren't always able to obtain all of the information needed to record accurate used oil figures. Figures for calendar year 2001 were not available until after this report was printed.



For Your Information: Waste Tires

Illegally stockpiled waste tires pose several environmental problems and at least two health threats: pests and fire.

Pests, including mosquitoes, rats, spiders and snakes, are very comfortable living in piles of tires. The most dangerous pests are the many kinds of mosquitoes that breed in the stagnant water collected in tires. Several varieties can carry deadly diseases like encephalitis, dengue fever and malaria.



A work crew resurfaces a road with rubberized asphalt made from used tires. This project was sponsored by the Asphalt Rubber Technology Service and was paid for through a grant provided by DHEC's Office of Solid Waste Reduction and Recycling.

In 1993, a regulation was passed that banned the burial of whole tires in solid waste landfills. Prior to the regulation, burial was the primary choice of disposal by local governments. By 1994, all counties were required by law to submit to DHEC their detailed Solid Waste Management Plan which included a section on waste tire management. Local governments were encouraged to develop and implement alternative waste tire disposal practices.

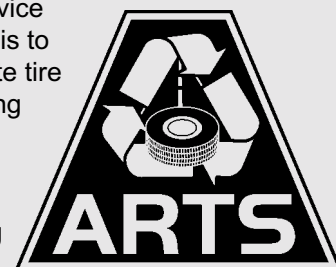
Although scrap tire piles do not spontaneously combust, tire fires are difficult to extinguish and can burn for long periods. Burning tires emit a heavy, black sooty smoke, releasing many chemicals and hydrocarbons into the air. There is an additional danger from melting petroleum oil that may contaminate streams and groundwater. The intense heat usually prevents successful fire-fighting efforts.

Removing tire piles is time consuming and expensive. Many times, more tires will be deposited as soon as a site is cleared. If not cleaned up, tire piles often attract dumping of other waste and debris. Costs associated with cleaning up tire piles are significant to government, industry and individuals.

Since 1993, DHEC's Office of Solid Waste Reduction and Recycling has provided grant funds to remove more than 7.5 million waste tires from illegal stockpiles. Grant funding is still available in some cases for tire removal and recycling. However, the solution to eliminating stockpiles is prevention. This requires a system that encourages proper management of waste tires, prevention programs that include laws and ordinances that address the problem, enforcement of state and local laws, public education and a commitment by officials to support these efforts with adequate funding, access to equipment and labor resources.

Since the Act was enacted, there has been advancements in tire recycling technology. Coupled with the ban on whole tires and availability of waste tire management funds there are now waste tire industries in South Carolina. These industries include waste tire processors, haulers and recyclers. These industries are required to report to DHEC on their operations. Reporting, permitting and registration requirements vary according to the type of industry.

Since 1995, tires have been used increasingly for Tire Derived Fuel and chipped as a replacement for aggregate in septic drain fields. In order to promote value-added uses for recycled tire material, DHEC awarded a \$6 million grant (over five years) in 2000 to the City of Clemson in conjunction with Clemson University. The University is charged with performing research and implementing projects to utilize tires in asphalt paving projects and other civil engineering projects as part of the Asphalt Rubber Technology Service (ARTS). ARTS' mission is to promote the use of waste tire rubber in civil engineering applications, which include, but are not limited to pavements, embankments, retaining walls and fill materials.



Miscellaneous Items

Miscellaneous items are considered nontraditional commodities. In some cases, there is a local market for a particular item or a county has identified a specific commodity to collect within the community.

Miscellaneous items include antifreeze, consumer electronics, fluorescent bulbs, food waste (post consumer only), household hazardous materials, latex paint, mattresses, used oil filters and bottles, wood packaging, other wood such as furniture, cabinets and other non-packaging products, and textiles (Figure 20).

Trends

The significant decrease in textiles is due, in part, to a textile recycler who discontinued his pick-up services, forcing many counties to stop collecting this commodity.

A new oil bottle draining program is in place and many local governments are now able to include them with their pigmented HDPE. This lowers the tons collected for motor oil bottles only. In addition, used oil filters saw a slight increase, due in part to program awareness and new markets for filters.

**FIGURE 20:
MISCELLANEOUS ITEMS COLLECTED**

MISCELLANEOUS ITEMS	FY01	FY00
Antifreeze	833	449
Consumer Electronics	5,672	765
Fluorescent Bulbs	9,842	2,350
Food Waste (post consumer only)	2,642	4,768
Household Hazardous Materials	340	158
Latex Paint	74	126
Mattresses	26	47
Textiles	33,402	63,765
Used Oil Bottles (if not included in plastics #2)	105	167
Used Oil Filters	1,116	969
Wood Packaging	59,961	27,157
Other Wood	594	1,518
TOTAL TONS	114,607	102,239

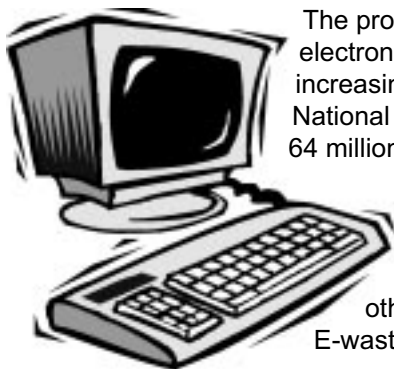
Did You Know?

FLUORESCENT BULBS: Fluorescent lamp manufacturers have significantly reduced the amount of mercury in lamps even as they have increased their energy efficiency. (SOURCE: "Pollution Prevention in South Carolina," Summer 1997)

HOUSEHOLD HAZARDOUS MATERIALS: The average American home has about 100 pounds of household hazardous materials (HHM) stored in the basement, garage or under the kitchen sink. Americans generate about 1.6 million tons of HHM every year, according to the U.S. EPA.

TEXTILES: According to the Council for Textile Recycling, 2.5 billion pounds of post consumer textile product waste was removed from the solid waste stream in 2001.

E-waste



The proper disposal and recovery of scrap electronics continues to be overshadowed by increasing production figures. According to the National Safety Council (NSC), it is estimated that 64 million computers will be obsolete and ready for disposal by 2005. Most communities across South Carolina and the United States still do not have appropriate outlets for recycling computers and other electronic equipment, also known as E-waste.

Issues

Discarded electronic equipment is one of the largest known sources of heavy metals and organic pollutants in the waste stream. Overall there is concern that if E-waste is not handled properly, products containing these hazardous materials may pose a serious environmental risk. While E-waste is classified as hazardous waste for businesses, it is not regulated for home-owners. When this equipment is dumped in a landfill or incinerated, toxic chemicals can be released because the equipment is no longer intact. There are several other factors for concern:

- Many of these electronic products have a short life span due to fast-paced improvements in the technology sector.
- There is a significant cost associated with curbside collection due to its bulk and weight.
- Electronic products consist of a wide range of thermoset plastic material which have limited recycling markets.
- The amount of precious metals used to make new circuit boards has diminished over the years resulting in a negative impact on profits for electronic recyclers.

Solutions

The key to a successful recycling initiative is the need for a steady stream of high-volume sources and the money required to implement automated processes. This could be resolved, in part, through regular collection programs designed specifically for this material.

"E-Scrap News" reported that 1,000 U.S. communities have undertaken some sort of special collection event or have organized permanent locations to capture electronics equipment. Efforts vary across the country from public/private partnerships between industry and state government to pilot outreach projects, grant programs and non-profits serving as collection sites. In South Carolina, Charleston County has started a permanent collection site while York County provides special collection days throughout the year.



Definitions

Cathode Ray Tube (CRT) - A glass picture tube found inside TVs, video game machines and computer monitors. CRTs contain lead. Many CRTs contain enough lead to exhibit the toxicity characteristic for lead, making them a characteristic hazardous waste.

Central Processing Unit (CPU) - The part of a computer housing the hard drive, processor, mother board, RAM, video card(s), modem and other system components.

Electronic Equipment - Products whose principal features are performed electronically. They include mainframes, computers, monitors, displays, TVs, personal digital assistants and consumer electronics such as cameras, VCRs, radios, microwaves, stereos, cell phones and hand-held computer games.

Electronic equipment can contain a variety of toxic materials that are detrimental to the environment if not properly disposed. Lead is the leading toxic material. Generally, lead is combined with tin to solder, which is used in the production of electronic circuit boards found inside electronic products.

E-Waste - Obsolete or damaged electronics equipment that cannot be repaired, upgraded or reused.

Results from recent E-waste pilot programs of the U.S. EPA and its Common Sense Initiative resulted in some interesting facts:

- Net costs ranged from \$0.17 to 50 cents per pound.
- The dominant costs were for:
 - Transportation
 - De-manufacturing
 - Disposal
- A variety of different program models were used:
 - Curbside collection
 - Drop-off events
 - Point of purchase (retail) collection
- The weighted average of all collection programs was comprised of:
 - Televisions (36 percent)
 - Audio and stereo equipment (16 percent)
 - Monitors (11 percent)
 - Computers (8 percent)
 - VCRs (6 percent)
- Most of the equipment collected was outdated and in poor condition, so it was expensive to handle and had low scrap value.
- Items that contained CRTs dominated, which drove up program costs.
- There were differences in efficiencies and costs between program models used:
 - Curbside collection yielded more pounds of material collected per resident, but had high transportation costs.
 - The cost per item collected was lower for one-day events due to lower transportation and operating costs, but it did not yield as high a volume.
 - Planning and promotion were essential to the effectiveness of the collection programs.

Information provided by the International Association of Electronic Recyclers Web site (www.iaer.org).

South Carolina Efforts

South Carolina is a member of the National Electronics Products Stewardship Initiative (NEPSI), an effort to bring stakeholders together to develop solutions for the issue of electronics product management. Those involved include federal, state and local governments, manufacturers, retailers, recyclers and environmental groups – all concerned and motivated to find a solution to E-waste.

DHEC's Office of Solid Waste Reduction and Recycling's Grants Section accepted proposals through March 1, 2002 from local governments for electronics recycling. Four recipients will be awarded up to \$25,000 to cover transportation costs, contract costs for repair or recycling of electronics and/or for the production of promotional/public education materials.

At the same time, it is not only local governments that are taking responsibility for the collection of this commodity. Industry also has taken steps to redesign computer equipment, the largest portion of this waste stream, that is more easily upgradeable, has interchangeable parts among different manufacturers and dismantles easily at the end of life. In addition, some groups are encouraging industry to consider take-back programs.

How much does it cost to recycle these items? While the costs involved vary depending upon location, it can range from no charge for pick-up and transportation, a cost of up to 50 cents per pound or a flat fee for monitors and TVs costing as much as \$20 per item.

Legislation

On February 20, 2002, Senate Bill 1031 was introduced to establish a statewide electronic equipment recycling program. The bill would impose a \$5 fee on each piece of electronic equipment containing a cathode ray tube (CRT) sold and require the state treasurer to deposit the money into an electronic equipment recycling fund. This fund would be used, among other things, to determine the most efficient means of collecting, transporting and processing scrap electronic equipment and to award grants, contracts and loans to further the process and technology for E-waste. Visit www.scstatehouse.net for the latest information.

NEPSI's Goal

The goal of the National Electronics Products Stewardship Initiative (NEPSI) is "the development of a system, which includes a viable financing mechanism, to maximize the collection, reuse and recycling of used electronics, while considering appropriate incentives to design products that facilitate source reduction, reuse and recycling, reduce toxicity and increase recycled content."

For More Information About E-Waste...

...contact the following organizations:

E-Scrap News
(503) 233-1305

International Association
of Electronic Recyclers
www.iaer.org

National Recycling Coalition
www.nrc-recycle.org

National Safety Council's
Electronic Product Recovery
and Recycling Directory
[www.nsc.org/ehc/epr2/
recycler.htm](http://www.nsc.org/ehc/epr2/recycler.htm)

U.S. EPA's
WasteWise Program
www.epa.gov/wastewise

ElectronicsRecycling.Net
www.electronicsrecycling.net

ElectronicXchange.Org
www.electronicxchange.org

County Success Stories

CHARLESTON COUNTY

Initially funded through a DHEC grant, Charleston County is establishing a permanent electronics collection location at the Bees Ferry Landfill. The county will provide this service for its residents at no charge. Charleston County has contracted with a company that charges up to 24 cents per pound for monitors and TVs and credits the county up to 37 cents per pound for cell phones.

YORK COUNTY

Using a warehouse from its purchasing department and an agreement with a contractor that involved no transportation costs, a one-day E-waste collection event was held by York County late last year. The county had expenditures for promotion and packaging material that was needed to prepare the collected electronic waste for shipping. The contractor provided the tractor trailers. One- and two-thirds trailers were filled with electronics equipment.

A similar event was held within the City of Rock Hill, collecting about the same amount of material. The city and York County hope to make this a yearly event with additional funding provided through a possible DHEC grant as well as including it within their budget. They are estimating a cost of \$5 per monitor, with an assumption they will collect up to 1,000 at the next event. Like Charleston County, there will be no direct cost to the residents of the county.



Discarded pallets were salvaged from the landfill and reused for York County's E-waste collection event.



Above: A variety of E-waste was collected by York County, including old computers, printers, fax machines and other equipment.



Left: County residents dropped off the majority of electronics for recycling, although local schools and businesses participated in the collection event as well.

Recycling Partners in South Carolina

Several state government offices and programs have been created and developed to encourage recycling in South Carolina. Some provide educational resources and technical assistance, while others work with businesses statewide to develop markets for most of the recyclables collected by county and private collection programs.

DHEC's Office of Solid Waste Reduction and Recycling

The Act created DHEC's Office of Solid Waste Reduction and Recycling (Office). The Office provides educational programs, technical assistance and grant funding to local governments, schools, colleges and universities and the public regarding solid waste issues. The Office, in accordance with the Act, has no regulatory, compliance or enforcement role.

The Office also serves as the partner and endorser of the U.S. EPA's WasteWise program. WasteWise is a free, voluntary program that has its partners set waste prevention, recycling and buying recycled goals. Established in 1994, WasteWise now has more than 1,000 partners. The Office recruits other organizations to become WasteWise members. Any organization or business in South Carolina can join the WasteWise program, including schools and manufacturers as well as commercial and retail businesses.

"R-E-C-Y-C-L-E, it begins with you and me!" Sound familiar? It's the opening line of the Office's national award-winning Recycle Guys Public Awareness Campaign. The Guys began their recycling career as the Office logo in 1992 and made their television debut in 1997, getting the word out about recycling. Winner of national Telly awards as well as local ADDY and Mercury awards, the campaign has been adopted for use in Maryland, North Carolina, Pennsylvania and the City of Denver among others.

Each year the Office honors the top recycling programs, projects and people in South Carolina for outstanding and innovative achievements in a variety of categories. The annual awards program is held each January. Please contact us for information on how you can nominate an outstanding recycling program or individual.



1-800-768-7348

www.scdhec.net/recycle



Recycling Market Development Advisory Council

The Recycling Market Development Advisory Council (RMDAC), established by the S.C. Solid Waste Policy and Management Act of 1991 and appointed by the Governor, formulates programs and policies to encourage markets for new and existing recyclable materials.

RMDAC is managed within the S.C. Department of Commerce to coordinate the activities of the Council and provide technical and economic development assistance to recycling businesses and industry.

RMDAC provides the following services:

- **Business Development Assistance for Recycling Companies**
 - ▶ Market data
 - ▶ Financial resources and business assistance links
 - ▶ Business planning
- **Market Development Initiatives**
 - ▶ Demonstration and pilot projects
 - ▶ Technology development assistance
 - ▶ Market analysis
- **Industrial Waste Recycling Resources**
 - ▶ Technical assistance for waste recycling alternatives
 - ▶ On-site recycling program assessment
 - ▶ S.C. Waste Exchange
- **Recycling Market Development Partners**
 - ▶ Business Recycling Assistance Program
 - ▶ Carolina Recycling Association

For more information about RMDAC, visit its Web page at www.callsouthcarolina.com or call (803) 737-0239 for assistance.



TEAM SOUTH CAROLINA

We perform. You win.

The Business Recycling Assistance Program

The **Business Recycling Assistance Program** provides an overview of technical assistance opportunities available to businesses, industry, government agencies and others in four specific areas:

- Waste Reduction;
- Recycling;
- Buying Recycled; and
- Recycling Markets/Market Development.

The Business Recycling Assistance Program utilizes the expertise of three non-regulatory organizations:

- **DHEC's Center for Waste Minimization** helps companies eliminate waste and potential pollution by increasing their material use efficiency and promoting the use of effective substitutes for materials that generate costly waste.
- **DHEC's Office of Solid Waste Reduction and Recycling** performs research and provides information on recycling issues, conducts workshops and trainings, and makes available a variety of recycling- and reduction-related publications.
- **The Recycling Market Development Advisory Council**, managed within the S.C. Department of Commerce, supports programs and policies to create markets for recyclable materials and provides technical and economic development assistance to recycling businesses, industry and other organizations.

Commercial and industrial waste are major contributors to South Carolina's landfills. Businesses and industry can help divert millions of tons of recyclable materials by implementing cost-effective waste reduction and recycling strategies.

These programs not only benefit the environment and conserve natural resources, but also can contribute to businesses' bottom lines through lower solid waste disposal fees and energy savings. The Business Recycling Assistance Program can help businesses outline a strategy to set waste reduction and recycling goals and a plan to reach those goals. And the best news is that all this advice and expertise is **free**.

For more information about the Business Recycling Assistance Program or to schedule a site visit, call **1-800-768-7348** or visit its Web site at **www.scdhec.net/brap**.



Industry Recycling in South Carolina

Definitions

Industrial pre-consumer waste is defined as any material used in the manufacturing process or material/by-product resulting from processing that does not reach the intended end user of the product being manufactured.

EXAMPLE: When paper mills place the paper by-product back into the paper manufacturing process instead of discarding, the paper put back into the process is considered a pre-consumer waste, thereby excluding it from the equation used to measure recycling and waste reduction.

In addition to traditional office recycling programs (aluminum, cardboard, paper etc.) if a processor recycles the package a raw material comes in/on, the package is considered an **industrial packaging/administrative waste**. As a general rule, materials included in this category are those things that do not enter the manufacturing process.

EXAMPLE: A textile company uses thread to make cloth. The thread comes on cardboard cones or spools. Once all of the thread on a spool is used, the spool is recycled. The spool is considered the industrial packaging/administrative waste. If the fluff from the thread is recycled by putting the fluff back into the manufacturing process, the fluff is considered a pre-consumer process waste.

For the past 11 years, the emphasis placed on recycling has been directed towards the residents of South Carolina through public awareness efforts like television, radio and newspaper inserts as well as local events, school presentations and curriculum for teachers. The word is out and most people know what to recycle and why it is so important for the environment. At the same time, those same efforts are now finding their way into South Carolina industries and businesses. Whether it is a company whose primary mission is to manufacture a product from recycled material or one that generates material that can be recycled, all share equal importance in the effort to recycle and reduce waste. While the equation to measure waste reduction and recycling rates includes the industrial packaging/administrative waste but excludes the industrial pre-consumer category, it is still worth noting the impact that industry figures have on the state's efforts.

Industrial waste comprises a huge portion of landfill space. In fact, about 40 percent of all waste comes from the business sector. The Business Recycling Assistance Program (see page 23 for more information) provides technical assistance to businesses who would like to initiate waste reduction and recycling programs in their facilities. In most cases, a cost savings will be recognized through the implementation of a recycling and waste reduction program.

The table below (Figure 21) shows the combined totals of industrial pre-consumer material and industrial packaging/administrative waste over the last two years. It is worth noting that businesses provide this information to their county recycling coordinators voluntarily. And for that reason, it also makes it somewhat difficult to compare from year to year. However, as participation increases each year for business and industry to report their recycling and waste reduction activities, it is becoming easier to make comparisons from year to year. And by knowing where we are in recycling and waste reduction will assist the state in focusing more on the areas that we can improve, whether it is residential or industrial, plastics or bottles, curbside or drop-off.

FIGURE 21: INDUSTRIAL PRE-CONSUMER AND PACKAGING/ADMINISTRATIVE MATERIAL RECYCLED

COMMODITY	FY01	FY00
Glass	1,099	5,136
Metal	296,532	3,746,476
Paper	331,465	1,314,730
Plastic	45,531	69,676
Banned Items ¹	39,488	15,833
Miscellaneous Items ²	175,359	169,412

1. Banned items include the following: lead-acid batteries, waste tires, white goods, yard waste and land clearing debris.
2. Miscellaneous items include: antifreeze, consumer electronics, fluorescent bulbs, food waste (post-consumer only), household batteries, household hazardous materials, latex paint, mattresses, used oil filters and bottles, wood packaging, other wood such as furniture, cabinets and other non-packaging products and textiles.